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THE SCARAB: EMBLEM OF ETERNITY

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While it is probable that most well informed people know in a vague, misty way that the emblem of the sacred beetle, held in high veneration by the ancient Egyptians, is identifiable in some way with the religious beliefs of that people, yet it is rather unusual to find any one who is able readily to give a clear explanation of the significance of the device. Perhaps this is due in some degree to the great variation of design and the consequent element of uncertainty which has existed among some Egyptologists as to the most probable meaning of this symbol. In view of this uncertainty, and of the perennial human interest attached to this matter, it is proposed here to review very briefly some of the most readily available data relating to the subject.

In Egypt the little objects of stone, pottery, emerald, green feldspar, obsidian, or other material, carved into various forms representative of a beetle, and engraven around the circumference or upon the bases with various devices, ornamental or hieroglyphic in character, may be considered as among the most common objects of art which have come down to us from antiquity, and they invariably excite the interest of the most casual traveler in that ancient land. There is much variety displayed in the form of these, as some are button-shaped, others are cylindrical, with or without a ring of gold or silver around the edge, while one form considerably used in Egyptian religions, especially upon the mummies of the period of the New Kingdom, appears with outstretched wings or bearing the head and horns of a ram.

The great majority of the emblems however are shaped to represent a beetle of the Coleopterous family Scarabaeidae, and this form is universally known as "the Scarab". It has been named for the black beetle, *Ateuchus sacer*, the metallic colored *Scarabaeus Aegyptiorum*, or related species numerous in the Mediterranean countries, and especially common in Egypt. These are closely related to the American *Canthon laevis* Drury, often seen along country roads and pathways, rolling tiny balls of excrementitious matter from place to place, hence popularly known in this country as "the tumble-bug".

The Egyptian name of the insect "kheperer," "khepari," or "khopi(r)." signified "become" or "create," likewise the substantive "phenomenon" or "marvel". In the form of "kheperi" the emblem was dedicated to the sun-god at Heliopolis, and from the temple at that place came the colossal granite scarab now in the British Museum. It was believed by the Egyptians that no female of the species existed but that the male, contravening the laws of generation, himself produced the egg and by his own act perpetuated the existence of the

species, therefore the scarab became a type of self-begotten deities and in particular of the god Kheperi who typified the rising sun.

In Egypt some of these little emblems were used as amulets, others were used as seals, while still others, like medals, were made to commemorate historical events. We are informed by Egyptologists that the soil of that country literally teems with them. They are often turned up while ploughing, and immense quantities have been found by antiquaries, under a variety of conditions, in thousands of tombs, especially those located along the banks of the Nile from Aswan to El Aria and Alexandria.

Curiously enough, the range in date of these little scarabs appears to be greater than that of any other class of inscribed monument; some of the older of them appearing to go back to the very dawn of history. To the data gleaned from inscriptions on such scarabs Egyptologists are indebted for the possession of much information of great value regarding the earlier dynasties. Further, they afford valuable clues to the student of ancient art in that they illustrate variations in styles during the different reigns and the inscriptions furnish facts of great value regarding customs and manners of the people in those far away times. Probably the most interesting and valuable of all the scarabs are those bearing the royal arms of the various dynasties. Various famous rulers were mentioned in these inscriptions upon scarabs of a date long subsequent to the periods of their reign. These range from Cheops of the IVth to the end of the XXVIth dynasty. During the reign of Amenophis III about 1450 B. C., a large number comprising in all five varieties of fine large scarabs were engraved and all were inscribed with names of this king and his queen Taia and those of her parentage—the latter possibly possessing a whimsical interest as a side light from hoary antiquity upon the mind of the eternal feminine.

It is to be expected that these Egyptian scarabs would be carried in trade to most of the near by countries, hence, it is not remarkable that they are found in occasional numbers on most of the islands and shores of the eastern Mediterranean, of Mesopotamia, and of Greece. The scarabs and their meaning were well known to the Jewish people and the reference in Hab. 2:11 translated as "beam" in the 1611 Authorized Version of the Bible has been interpreted in the Septuagint and Vulgate as "Scarabaeus". The forms of the Egyptian scarab have inspired some of the finest Etruscan gems of the sixth and fifth centuries B. C. and they have suggested some remarkable and interesting forgeries in more recent years.

As there has been a great deal of discussion of the origin and meanings of the devices of some of these scarabs, so there has been, as is usually the case, the utmost variation of opinion. The limits of this paper forbid a detailed discussion of the various interpretations which have been promulgated. It will be sufficient to indicate that they are of very unequal value; some of them being too trivial for serious consideration, while others of them being brought together from the writings of remote antiquity and representing the results of prolonged study may therefore be duly accredited. While there is no doubt that there has been considerable variation in the significance of the scarab at different periods and under different conditions of Egyptian history, its primary and enduring significance undoubtedly was that of a religious emblem denoting the reincarna-

tion of the body or the immortality of the soul. There are abundant evidences of the truth of this for there are to be found numerous instances in which the emblem was used and worn by the Egyptians in a manner not unlike that of some Christian people of today in wearing a crucifix or cross as an emblem of their religion and of the God they worship. Plutarch has directed attention to the fact that the *Hermitybics Calasiries*, the soldiery of Egypt, each carried a ring upon which this beetle was inscribed. It is also known that these soldiers, just before going into battle, placed scarabs around their necks. True to habit a variety of probable explanations of this procedure also has been made, though it appears most probable that the Egyptians may have used these emblems for markers as aids in identifying bodies of the slain and as a preliminary to the rites of burial.

The use of scarabs as seals was very extensive, especially in the Middle Kingdom (beginning Cir. 3000 B. C.) and New Kingdom (beginning Cir. 1700 B. C.) The seal type of scarab is not only extremely abundant, but the sculpture represents an almost endless variety of design. In some instances apparently the original design was executed with great care and exactness and afterwards was unskillfully copied by ignorant engravers until the original meaning was lost. It is of interest to study the meaning of some of these mottoes, ranging as they do from references to deities, magical devices and places, down to hints of good cheer and friendly wishes, such as, "Memphis is mighty forever," "Mut give thee long life", or "Bubastis grant a good year". Some scarabs made of amethyst were shaped with bases flat and with designs engraved thereon in intaglio and were pierced longitudinally for threading or for a swivel. While these probably were intended principally for seals, they might also be used as beads, necklaces, or other ornaments.

Not only did the nobles and other military and higher classes wear the sacred Scarab in a variety of forms about their persons, but there are abundant evidences to show that the lower classes of the population were equally devout. The emblems undoubtedly were adopted universally both in life and in death. They are found in greatest profusion painted upon and as emblems within the coffins of the dead both of the higher and of the lower classes. A large stone scarab upon which was engraved chapter 54 of "The Book of the Dead", often was placed in the bandages of the mummy. This was in the form of a written appeal that the heart of the dead person might not betray him when he came into judgment before Osiris. By virtue of this amulet the deceased was enabled to pass the ordeal of the "weighing of the heart" at the final judgment. A number of scarabs as well as actual specimens of the various species of beetles were placed here and there over the body, and a winged scarab frequently of very hard stone and skillful workmanship often was laid upon the breast. Not infrequently the heart was removed during the process of embalmment and the emblem substituted in the cavity. They may be seen sculptured on funeral tablets buried with the bodies, or on the ornaments of the ring, the necklace, or in pendants attached to them, or in a veritable multiplicity of arrangements.

It is obvious to an entomologist that the rather striking habits of this beetle would be the source of many superstitions among ignorant and credulous people such as were the fellahs of the Nile. One can picture something of the simple wonder with which they watched the actions of the beetle, working busily,

always in pairs, along the cattle path or upon the sandy slope of a hillside pasture on a sunny afternoon, compacting, coating with dust, or transporting its pellet by pushing it backward with its hind legs, with great diligence and patience, through all manner of difficulties until placed in the desired spot. Whatever the Egyptians may have understood concerning its habits and its life history, which greatly resemble that of our common *Canthon*, it is known that they held the little insect in highest veneration, compared its tiny globe to the sun, and they builded up much fanciful superstition about it. Pliny has stated that it relieved the eye of fatigue to gaze upon the golden green *Ateuchus Aegyptiorum* of Latreille, a notable variety found widely in Egypt and Nubia. Several nearly related species of the present genus *Ateuchus* also were objects of veneration, and about thirty species have been described thus far from Africa.

It is at once interesting, and pathetic, to study the thought underlying the positions in which some of these Scarabaei most commonly were placed upon the mummies: They may be found most often on the chest next to the flesh and underneath the eye lids, the scarab in this position probably being most significant to them as representative of life and animation; symbolic that the heart some time would resume its pulsations and that the eye some time would flash again. The humble insect placed in these positions is overwhelmingly indicative of some kind of belief by them that a time would come when the heart would indeed throb again, and the eye truly regain its sight, and when the body would be reanimated and the soul having completed its term of transmigration would again return to the body in resurrection or would take on a new being in immortality.

The anthropologist, trained to sensitiveness in apprehension of every clue pointing however faintly or dimly toward great principles, is swift to heed and deduce the larger meaning of this overwhelming impulse manifested in the people of that far away time who used the little scarab as an emblem of the deathless desire and hope in them, and in mankind, and which has had so many other manifestations through the centuries, all pointing toward one interpretation.

In studying the scarab, and something of what it has meant in times past to these people and to humanity, one may be reminded of a statement from the pen of Ingalls in discussion of a lecture heard by him upon the evidences of immortality. The speaker had held the rapt and breathless attention of an immense audience comprising all that was cultured, brilliant, and renowned of a city while "he dwelt with remarkable effectiveness and power upon the fact that nowhere in nature, from the highest to the lowest, was an instinct, an impulse, a desire implanted, but that ultimately were found the conditions and opportunities for its fullest realization." He instanced the wild fowl which, moved by some mysterious impulse, start on their prodigious migration from the frozen fens of the north and reach at last the shining south and the summer seas; the fish which, from the tropic gulfs, seek their spawning grounds in the cool bright rivers of the north; the bees which find in the garniture of the fields and forests the treasures with which they store their cells, and even the wolf, the lion, and the tiger, that are provided with their prey. Turning to humanity he alluded to the brevity of life; its incompleteness; its aimless, random and fragmentary careers; its tragedies, its injustices, its sorrows and separations.

Then he referred to the unsatiable hunger for knowledge; the efforts of the unconquerable mind to penetrate the mysteries of the future, its capacity to comprehend infinity and eternity, its desire for the companionship of the departed, its unquenchable aspirations for immortality, and he asked: "Why should God keep faith with the beast, the bee, the fish, and the fowl, and cheat man?"

REFERENCES

1838—Hope. On the notions entertained respecting the emblem Scarabaeus. *Trans. Ent. Soc. Lond.* v. 2, pp. 172-174.

1894—Myer. *Scarabs*. London.

1897—Wiedman. *Religions of the Ancient Egyptians*. New York.

1899—Petrie, *Historical Scarabs*. London.

1902—Ward. *The Sacred Beetle*. New York.

1906—Newbury. *Scarabs*. London.

1916—Dow. The testimony of the tombs. *Bull. Brooklyn Ent. Soc.* v. 11, pp. 25-33. pl. 1, figs. 11.

TWO NEW SPECIES OF ACHORUTES (COLLEMBOLA)

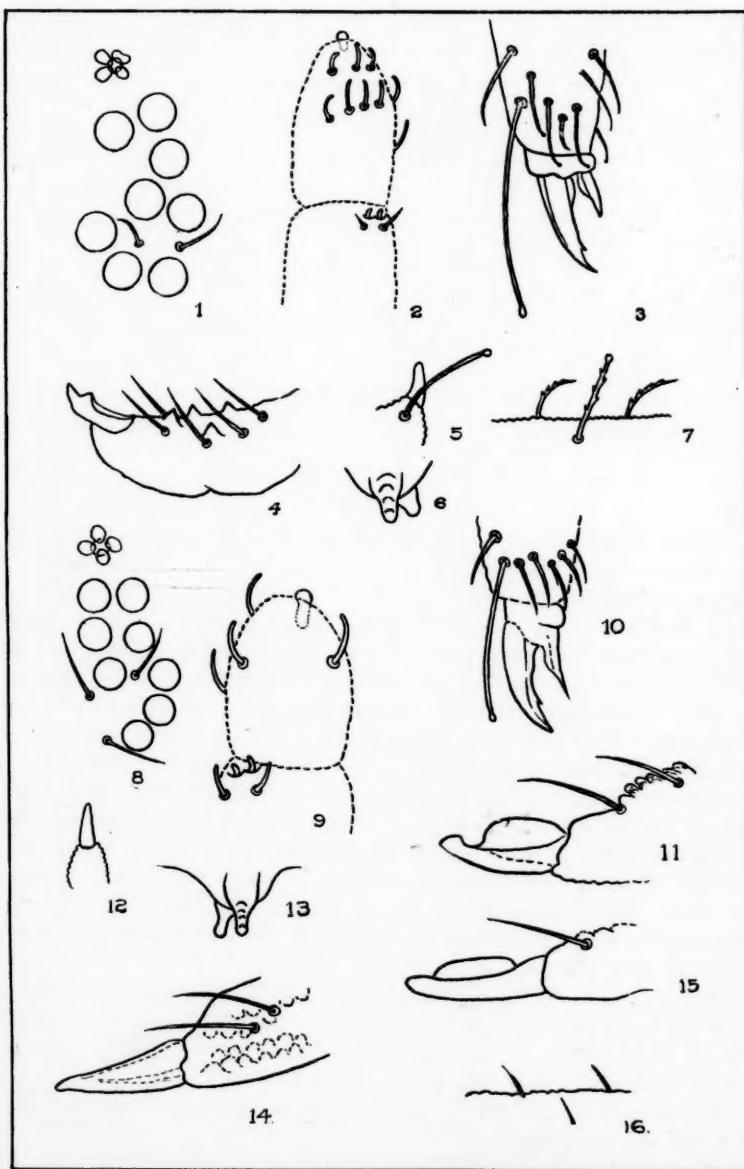
BY CHARLES MACNAMARA,

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When acquaintances, only pretending, I fear, to a polite interest in my hobby, ask me where I find snowfleas, my answer is: "Everywhere." Any winter day when the temperature is 25 degrees F. or higher, once you get away from the precincts of the town these hardy minute insects are almost sure to be found on the snow over large tracts of country, sometimes sparingly and sometimes in incredibly vast numbers. When they are relatively few, any one species of the half-dozen regular snow frequenters may be in the majority. But when they are many, it is invariably teeming hosts of *Achorutes socialis* Uzel that speckle the snow over whole townships and perhaps counties. Although these tremendous outbreaks are very interesting for the collector they have a serious drawback. While they are in progress it is rarely possible to find any species on the snow except *socialis*. Others are certainly there, but as to the unaided eye all snowfleas are little more than black specks on the white surface, the others are indistinguishable among the innumerable swarms of *A. socialis*. It is worse than looking for a needle in a hay stack. It is like looking for one particular straw in a whole lot of straw stacks.

But it is only the logically impossible that never happens. (And since Einstein has made parallel lines meet, even this seemingly safe proposition may not be incontrovertible.) The merely improbable, no matter how improbable, is sure to occur some time or another. And so it was in the midst of a vast issue of *Achorutes socialis* that a hitherto unknown member of the Collembolan snow fauna was discovered.

The date, 12th Dec., 1920, as far as I can remember, marked no very significant event in human affairs. But for some reason or other it was a most important day for the snowfleas of my district, and some common instinct had



NEW SPECIES OF ACHORUTES

moved thousands of millions of them to come to the surface. My walk that day was in the Nopiming Game Reserve, a small wild life sanctuary of some 2,000 acres established on the shores of the Ottawa near Arnprior. (And although he is not usually classed as a wild animal, it is for the entomologist also a blessed refuge, where he can go about his collecting unafraid that a rash hunter will shoot him for a deer, or that the reckless small boy with the deadly "22" may mistake him for a chipmunk.) The day was calm with light clouds and the ground was covered with four inches of hard snow, making fine walking. There were no signs of thawing anywhere, the temperature ranging from 25 degrees F. in the morning to not higher than 30 degrees F. in the afternoon. Although this was a little lower than usual optimum temperature for snowfleas, the insects were out in greater number than I had ever seen them before, and a remarkable feature of the emergence was their wide and even distribution.

They were not, as I have often seen them, slowly oozing in blue black masses from crevices of rotten logs, nor were they patching tree trunks in close corporations that looked like plaques of dark blue powder, nor were they blackening the snow for yards around rotten stumps. Congregated at no particular foci, they were evenly dispersed everywhere. And everywhere is the right word. Averaging perhaps five or ten to the square foot, they were all through the woods and swamps,—a little thicker in the open hardwoods than among the conifers, for they always move towards the light—they were all over the ice of creeks and beaver meadows, and had spread across fields and clearances. They had even travelled to a considerable distance out on to the frozen surface of the Ottawa River. I do not know how many thousands of acres they may have covered, for I did not reach their southern or eastern boundaries, but they were distributed with very fair uniformity over the six or eight miles I walked through them, and I imagine they must have extended a long distance beyond the limits of the Game Reserve.

Every few yards I would stop and look at the snow. It was always sprinkled with the black specks moving with the stolid aimless deliberation characteristic of *Achorutes*. The *Isotoma* species are much brisker and more nervous in their habit. After walking thus through several miles of snowfleas, I got tired looking at them, but at last there came a slight break in the monotony. As I crossed a field and approached the uplift of a low terrace edged by an outcrop of rock that marked some ancient beach of the Ottawa, I paused once more to look at the eternal *Achorutes* at my feet. And there I noticed among the many, a few, blue black like the rest, but much smaller than any of the others. A late generation of *A. socialis*, I thought, or one that has not thriven like their more portly brethren. However, as this is the only variation I have seen all day, better pick up a few.

At night the half dozen or so specimens collected were duly preserved and labelled, but were not studied until a month later. They were then seen to be a new species, curiously combining some of the diagnostic features of both *Achorutes socialis* and *A. packardi*. Of course, I immediately wanted more of them, and at the first chance hurried off to the rocky ridge, where with unusual

good fortune, I found them again. Later, in February and March, I discovered them around the roots of beeches in a neighboring wood; and in April I sifted a few out of moss on the rocks where they first appeared. They were never in great numbers, and it usually took about an hour's steady search to gather in a dozen individuals.

Achorutes nothus n. sp.

Color dark blue; cuticle finely tuberculate. Eyes (fig. 1) eight on each side. Postantennal organ (fig. 1) with four peripheral tubercles. Antennae three-quarters length of head; segments as 5: 15: 15: 22; at apex clavate protrusible sense organ (fig. 2) and nine or ten "olfactory" hairs; on outer side of third segment distally a small organ of two curving rods with two stout guard hairs (fig. 2). Unguis (fig. 3) long, curving, unidentate on inner margin one third from tip. Unguiculus not quite half as long as unguis; broad lamella at base, apex sharp rounded. One tenent hair feebly knobbed surpassing end of unguis. Distally on tibiotarsus several knobbed hairs bent apically. Dens (fig. 4) short and stout, swollen and rounded apically with four or five conical teeth dorsally; mucro inserted on inner side of apex of dens, one quarter length of dens, apically slightly curved with one large tooth as fig. 4. Anal spines (fig. 5) one third length of hind unguis on low papillae. Tenaculum (fig. 6) quadridenticulate. Clothing (fig. 7) stout curving serrate setae, and long capitate setae with a few small serrations, those on posterior segments more strongly knobbed than those towards head. Maximum length 1 mm. Found on snow November to March; and in moss on rocks in April, at Arnprior, Ontario, Canada.

Dr. J. W. Folsom, who kindly examined these insects for me, points out that the claws, anal spines, and furcula closely resemble the corresponding organs of *Achorutes socialis*, but the teeth on the dentes are fewer and do not shade off into smaller teeth as in *socialis*. The clothing of serrate and capitate hairs however is very like that of *Achorutes packardi*, a species which rarely if ever comes out on the snow, although sometimes to be found in midwinter under bark or walking around on stumps.

In the field *Achorutes nothus* may be distinguished by its small size, but this is no great distinction, as *A. socialis* of 1 mm. in length are also not infrequently seen on the snow.

The other new *Achorutes* here described was forwarded to me by the Dominion Entomologist for identification, having been sent into the Entomological Branch by Mr. Ricker, of Monteith, Ont. They were collected by the Monteith station agent, Mr. J. D. Allen, from a space of a few square feet on his lawn, where they appeared in such numbers that nearly half a cupfull was gathered with the aid of a spoon. They had apparently come out of the soil, as Mr. Allen tells me there was no rotten wood or debris in the vicinity that might have sheltered them.

And alas! how often must the innocent suffer with the guilty. The harmless *Achorutes* was sacrificed for the evil deeds of the cutworm and the locust. Having in mind the destructiveness of insects in general, Mr. Allen was doubtless alarmed for his lawn when he saw this horde of *Achorutes*. He writes in 1921:

"The balance of the insects were destroyed with coal-oil, and to date have not noticed any more."

Achorutes pannosus n. sp.

Color dark blue; as material was received in bad condition cannot say if uniform or mottled. Cuticle finely tuberculate. Eyes (fig. 8) eight on each side. Postantennal organ (fig. 8) with four peripheral tubercles. Antennae four-fifths length of head; segments as 5: 10: 10: 15; at apex protrusible clavate sense organ (fig. 9); also five or six curved "olfactory" hairs; distally on outer side of third segment, a small sense organ of two short curving "pegs" in little pits with two stout curved guard-hairs (fig. 9). Unguis (fig. 10) stout, curving, unidentate in apical third. Unguiculus acuminate, about half as long as unguis. Tenent hair, one with small knob, not extending to end of unguis. Dentes two and one-half times as long as manubrium, with large dorsal tubercles distally. Mucro (fig. 11) one third length of dens, hooked apically with wide lamella or in a small percentage of specimens, not hooked apically with narrow lamella as in fig. 15. Anal spines (fig. 12) one third length of hind unguis, on prominent papillae about same length as spine. Tenaculum (fig. 13) quadridenticulate. Clothing (fig. 16) a very few short simple setae. Maximum length 1 mm.

Achorutes pannosus comes close *A. maturus* Fols. but differs in the presence of large dorsal tubercles on the dentes, broader base of unguiculus, longer anal spines, and in the shape of the mucro, as well as some other minor differences. The species also approaches the European *A. manubrialis* Tullb. but is separated from the latter principally by differences in mucrones, unguiculus and postantennal organ.

EXPLANATION OF PLATE 2

Fig. 1. *Achorutes nothus*, eyes and postantennal organ of left side, x 570.
 " 2. " " olfactory hairs and sense organs of right antenna x 400.
 " 3. " " right hind foot x 500.
 " 4. " " lateral aspect of dens and mucro x 420.
 " 5. " " left anal spine x 500.
 " 6. " " tenaculum x 560.
 " 7. " " clothing of first abdominal segment x 480.
 " 8. *Achorutes pannosus*, eyes and postantennal organ of right side x 600.
 " 9. " " olfactory hairs and sense organs of left antenna x 600.
 " 10. " " right hind foot x 530.
 " 11. " " lateral aspect mucro and dens, principal type, x 1,000.
 " 12. " " anal spine x 600.
 " 13. " " tenaculum x 600.
 " 14. " " dorsal aspect, variant form of mucro, x 1,000.
 " 15. " " lateral aspect, variant form of mucro, x 1,000.
 " 16. " " clothing of first abdominal segment x 500.

SEXUAL ATTRACTION OF THE FEMALE HESSIAN FLY*
(*PHYTOPHAGA DESTRUCTOR SAY*)

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An accidental observation on April 2, 1921, at Centralia, Illinois, prompted a short study of the field activity of the male Hessian fly. On this date a female fly, emerging from a flaxseed partially covered by mud, became entangled and stuck, but was not so hidden as to evade the courtship of a number of male flies. A miniature swarm attended the female. Three and four males made offers of copulation at the same time while others stood facing the female or walking and flying impetuously about until an opportunity came to replace the ones in closer touch with her.

Following the clue given by the helpless female fly, several small cylindrical cages one inch in diameter and three inches tall were stocked with newly emerged females of known age, care being taken to obtain individuals which were still soft, uncolored, and unfertilized. Five females were imprisoned in each cage and the cages placed on the surface of the ground in the field as desired.

OBSERVATION I.

Five cages containing females were placed in the field. Over each cage was placed a larger wire cage three inches in diameter and ten inches tall painted with tanglefoot. These cages were placed at 9 a. m., April 2, and the males excited by the presence of the females, were caught, counted and removed as shown in Table I. The females were left undisturbed until the males failed to be attracted. On April 4 only one female fly was alive in each cage and the following day all were dead.

TABLE I.

Date	Hour	Cage 1	Cage 2	Cage 3	Cage 4	Cage 5	Total
Apr. 2	10 a. m.	43	159	43	99	86	430
	11 a. m.	50	103	51	60	138	402
	4 p. m.	42	91	80	39	20	272
Apr. 3	9 a. m.	190	140	240	145	87	802
	11 a. m.	142	81	126	109	43	501
Apr. 4	4 p. m.	11	15	12	32	10	80
	9 a. m.	57	126	118	169	80	550
	11 a. m.	46	61	56	40	18	221
Apr. 5	4 p. m.	9	8	29	6	3	55
	9 a. m.	93	32	17	47	45	234
	11 a. m.	0	0	0	0	0	0
Apr. 6	4 p. m.	0	0	0	0	0	0
	9 a. m.	24	15	5	17	3	64
	11 a. m.	0	0	0	0	0	0
Apr. 7	4 p. m.	1	0	0	1	3	5
	9 a. m.	0	1	1	1	8	11
	11 a. m.	0	0	0	0	0	0
Total		708	832	778	765	554	3627

The results show that an average of 145 males were attracted for each of the 25 females confined. In the case of the five females in Cage 2, a maximum average of 166 males per female was obtained and in Cage 5 a minimum average

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of 109 males per female was obtained. It was noted during the observation that the males advanced against the wind and the advance was made slowly from a general assembly area a short distance from the females. The attraction to all cages continued even after all females were dead. The greatest number of males were caught on the cages just above the ground surface, thence upward for three inches. The activity of the males was most manifest early in the morning.

OBSERVATION 2.

To determine the area of attraction and the limits of the zone of advance or assembly, three cages, numbered 1, 2, and 3, were placed in the field in separated places. Concentric circles were marked around all the cages with radii one to fifteen feet. The leeward arcs of ninety degrees were the observational limits of cages 1 and 2. For cage 1 the arcs were set with screen wire painted with tanglefoot and for cage 2 set with tanglefoot painted in one inch strips on the ground. For cage 3 the concentric circles were used for points of position only, the observations being centered on the side of the sector set with tanglefoot screens enclosing an arc of forty-five degrees on the leeward side of the cage. The observation started at 10 a. m., April 3, and ended the same day at 3 p. m. The number of males caught in the tanglefoot at one foot intervals from one to fifteen feet, is shown in Table 2.

TABLE 2.

Distance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Cage 1	35	15	2	4	18	12	3	0	0	0	0	0	0	0	0	89
Cage 2	35	25	37	26	42	40	10	9	4	2	7	5	3	1	0	246
Cage 3	87	116	18	15	10	4	4	8	7	1	0	0	0	0	0	270
Males caught																
Total	175	156	57	45	70	56	17	17	11	3	7	5	3	1	0	605

Males within fifteen feet of the females were apparently attracted and definitely so within ten feet. The zone of assembly was particularly outlined from one to six feet from the females.

During the time the cages were run in both observations the wind was in a constant south and south-west direction with a velocity of six to eight miles per hour and a maximum not over twelve. Fly emergence in the field was at its maximum intensity for the season and the weather clear and warm.

A NEW PARASITE OF THE SPRUCE BUDWORM (HYM.).

BY S. A. ROHWER,

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The following description of a new species of *Phytodictus*, reared by Mr. A. B. Baird as a parasite of the spruce budworm, is presented at this time so the name may be used in a forthcoming paper dealing with this moth.

Phytodictus fumiferanae new species

Allied to *Phytodictus annulatus* (Provancher) from which it may be distinguished by longer postocellar line, dark hind legs and different colored coxae of the male.

Female.—Length, 8 mm.; length of antenna, 8.5 mm.; length of ovipositor beyond abdomen, 3.5 mm. Slender; clypeus depressed medianly along anterior

margin, which is slightly emarginate; area between eyes but little higher than broad; eyes nearly parallel within; face finely granular, frons more finely so; postocellar line nearly twice as long as the ocellular line; depressed areas of scutellum and metanotum without sculpture; propodeum shining with a faint median depression; anterior basitarsus about two-thirds the length of their tibia; calcaria of hind tibia but little less than half as long as hind basitarsus; abdomen shining, the second tergite but little longer than the third. Black; palpi, mandibles (except apices), small spot on inner superior orbits, usual spots on scutum, tegulae, small spot below hind wings, two small spots of anterior margin of scutellum and a larger posterior spot, median spot of metanotum, interrupted V-shaped line on posterior face of propodeum, and narrow apical margins of tergites, whitish; legs rufous; trochanters whitish; basal part of hind trochanters, hind femur, except rufous mark beneath, hind tibiae except extreme white base, and hind tarsi black; wings hyaline, iridescent, venation dark brown, stigma yellowish medianly.

Male.—Length, about 7 mm.; length of antenna, about 8 mm. Differs in color from the female as follows: head below antennae, scape beneath, proepisternum and lower lateral margin of pronotum, four anterior coxae, mesosternum and lower part of mesepisternum, yellowish-white; hind coxae black above, yellowish-white beneath.

Type locality.—Lillooet, British Columbia. Described from two females (one type) and one male (allotype) reared by A. B. Baird from cocoons collected July 11, 1919. The male issued in the laboratory February 7, 1920, and the females February 9, 1920.

Host.—Spruce budworm, *Tortrix fumiferana* Clemens.

Type and allotype.—Cat. No. 23068 U. S. N. M.

Paratype.—Canadian National Collection.

NOTES ON COCCIDAE. IX. (HEMIPTERA)¹.

BY G. F. FERRIS,

Stanford University, Calif.

The present classification of the genera of the subfamily Coccinae (or Lecaniinae) is based for the greater part upon the nature of the secretions and only to a small extent upon the morphological characters of the insects themselves. Some justification for this is to be found in the fact that the secretions present a wide range of form while in the more conspicuous features of their morphology the many species of the subfamily are, with but few exceptions, extraordinarily conservative. However, I can not believe that any really satisfactory classification can be arrived at until an exhaustive study of the insects themselves has been made and the facts thus obtained have been correlated as far as may be with the more easily observable facts of habit and character of the secretions.

On the other hand, I am somewhat inclined to believe that a complete correlation of this sort can not be obtained for it seems probable that some of the differences in the nature of the secretions are in part due to differences

¹Continued from Canadian Entomologist, 53: 95. (1921).

in the physiology of the insects and not in their structure. In such cases it would seem entirely proper to give due consideration to such factors in attempting to arrive at a natural arrangement of the species.

Genus *Takahashia* Ckll.

The original description of this genus (as a subgenus of *Pulvinaria*) includes merely the following statement, "Similar to ordinary *Pulvinaria* in general structure but forming a very long, firm ovisac, which projects from the twig in a curve about 17 mm. long, carrying on its end the shriveled body of the female".

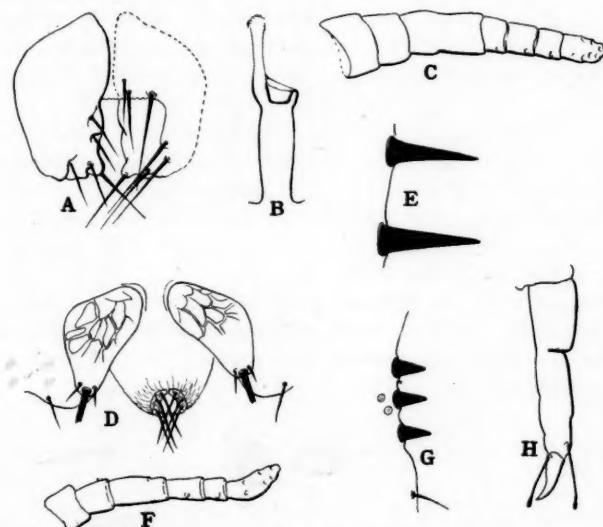


Fig. 1. *Takahashia japonica* Ckll.: A.—anal plates of adult; B.—tubular duct; C.—antenna of adult; D.—anal plates of first stage; E.—marginal setae of adult; F.—antennae of first stage; G.—stigmatic setae of first stage; H.—anterior tarsus of adult.

I have at hand material of *T. japonica* Ckll. and *T. jaliscensis* Ckll., the former being the type of the genus. On the basis of the type species I would define the genus as follows.

Coccoidea referable to the subfamily Coccinae (of the Fernald Catalogue); antennae and legs well developed, the former tending to be rather short; marginal setae present; stigmatic clefts practically obsolete, the stigmatic setae but little or not at all differentiated; anal plates of ordinary form, anal ring with eight setae; derm remaining membranous at maturity, beset dorsally with relatively few, simple pores and a few small, tubular ducts, ventrally with great numbers of circular, multilocular pores and tubular ducts. In life with the dorsum practically bare of secretion; at maturity secreting an ovisac.

On the basis of this characterization *T. jaliscensis* Ckll. could not be referred to this genus for the dorsum is beset with numerous small, 8-shaped pores. However, until a better understanding of generic limits has been attained it may well remain here. *T. citricola* Kuwana, as far as I can see, is simply a

Pulvinaria, having the stigmatic setae strongly developed as in the latter genus.

Whether *Takahashia* can really be maintained as distinct from some of the other genera of the same general type, such as *Lichtensia* and *Philephedra*, is a matter that will require much further study to settle.

Takahashia japonica Ckll. (Fig. 1.)

Material Examined. From various hosts in Japan, being the material recorded in Kuwana in 1902.

Notes. The antennae (Fig. 1C) are well developed but rather short and stout. The legs are likewise well developed, although rather small, the tarsal claw and digitules quite slender. According to Cockerell the anterior tarsi are apparently two-segmented. While this condition appears to be quite constant, it appears to be due merely to a fold and not to a genuine segmentation (Fig. 1H). The marginal setae (Fig. 1E) are quite large, stout and sharply pointed and are arranged in a definite single row. The stigmatic setae, if differentiated at all seem only to be slightly stouter, and at times slightly smaller than the marginal setae. The anal plates (Fig. 1A) are of quite ordinary form, but somewhat variable. The ventral side of the body in the abdominal region bears great numbers of circular, multilocular pores and a sub-marginal zone of crowded, tubular ducts of the type shown in Fig. 1B.

The first stage has the antennae (Fig. 1F) rather slender, five-segmented. The marginal setae are very few, small and filiform and the stigmatic setae, three in each group, are small, stout, conical and equal. The anal plates (Fig. 1D) are somewhat reticulate.

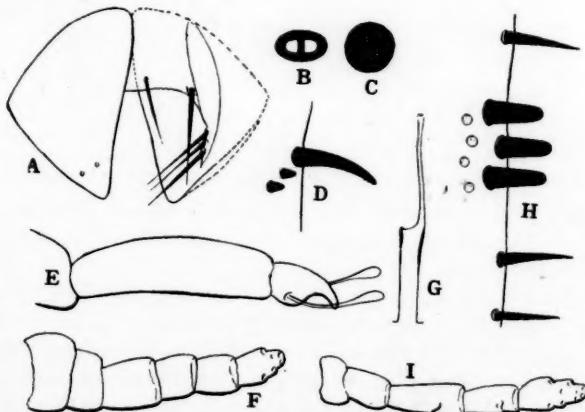


Fig. 2. *Takahashia jaliscensis* Ckll.: A,—anal plates of adult; B,—S-shaped pore from dorsum; C,—circular pore from dorsum; D,—stigmatic setae of first stage; E,—anterior tarsus of adult; F,—antenna of adult; G,—tubular duct; H,—stigmatic setae of adult; I,—antenna of first stage.

Takahashia jaliscensis Ckll. (Fig. 2).

Material Examined. A slide mount, labeled "type" received through the kindness of Professor Cockerell.

Notes. This species resembles *T. japonica* in having the antennae (Fig. 2F) rather short and stout, but they have six instead of seven segments. The legs are much larger and stouter than in *japonica* and the claw (Fig. 2E) is stout. The tarsus is but little more than half as long as the tibia. The marginal spines are arranged in a definite single row, are rather stout, tapering and sharply pointed; the stigmatic depressions are very shallow, the stigmatic setae (Fig. 2H) short, stout, but slightly tapering, with blunt tips, subequal. The depressions are connected with the corresponding spiracles by a rather broad zone of circular pores. The anal plates (Fig. 2A) present no peculiarities.

The derm is membranous, beset dorsally with numerous very small, 8-shaped pores (Fig. 2B) and with larger, circular pores (Fig. 2C) which are concentrated in a median area, particularly in front of the anal plates. On the ventral side there are great numbers of circular, multilocular pores in the abdominal region, together with a zone of very small, tubular ducts (Fig. 2G).

The first stage larva has the antennae (Fig. 2I) rather slender, five segmented. The marginal setae appear to be lacking; the stigmatic depressions bear three setae of which the cephalic is quite large and long and the other two very small (Fig. 2D). The anal plates have very much the same form and appearance as in the adult but bear a very long apical seta.

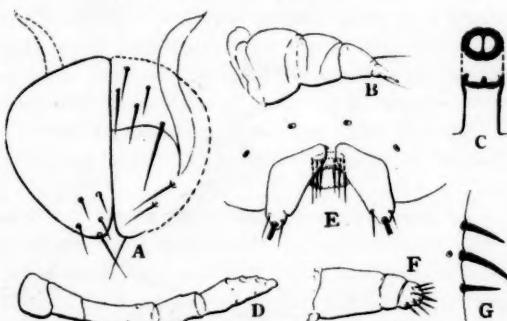


Fig. 3. *Pseudophilippia quaintancii* Ckll.: A,—anal plates of adult; B,—leg of adult; C,—8-shaped pore of dorsum of adult; D,—antenna of first stage; E,—anal plates of first stage; F,—antenna of adult; G,—stigmatic setae of first stage.

Genus *Pseudophilippia* Ckll.

The original description of this genus is merely the following: "A Lecanini Coccid with, in the adult ♀, rudimentary legs and antennae; secreting a profusion of cottony matter, which completely covers and hides it. Skin not chitinous."

I rewrite this description as follows:

Coccidae referable to the subfamily Coccinae (of the Fernald Catalogue); with the antennae and legs very greatly reduced, but retaining their segmentation, the antennae apparently four-segmented; with the stigmatic depressions obsolete and the stigmatic setae lacking; without marginal setae; with the dorsum thickly beset with rather small, 8-shaped pores borne at the inner end of short ducts. In life with the dorsum thickly covered with fluffy, white secretion; not secreting an ovisac.

Pseudophillippia quaintancii Ckll. (Fig. 3).

Material Examined. From *Pinus* sp., Parksley, Virginia.

Notes. Antennae (Fig. 3F) very small, but with the segmentation fairly distinct, the specimens examined showing them as four-segmented. Legs (Fig. 3B) likewise very small but with the segmentation normal. Marginal setae and stigmatic setae apparently entirely lacking. Dorsal pores extremely abundant, upon careful examination showing as definitely 8-shaped and borne at the inner end of a short duct (Fig. 3C). Venter apparently without circular multilocular pores and with tubular ducts, if present at all, very few. Anal plates (Fig. 3A) roughly circular in outline, setae distributed as indicated in the figure. Derm but slightly chitinized.

First stage with the antennae (Fig. 3D) quite slender, five-segmented. Derm beset with many small, 8-shaped, sessile pores, these arranged in transverse rows on the abdomen. Marginal setae very few and small; stigmatic setae three in each group, very small and slender, the median seta slightly longer than the others. Anal plates (Fig. 3E) of ordinary form.

Cryptostigma new genus.

Coccidae referable to the subfamily Coccinae (of the Fernald Catalogue); with the antennae and legs vestigial; spiracular depressions very deep and with the base surrounded by a conspicuous, heavily chitinized, crescentic dorsal plate which is thickly beset with small pores; spiracles very large, lying directly beneath these plates; stigmatic setae lacking, marginal setae present; derm for the most part membranous, beset dorsally with many minute, simple pores and ventrally with a relatively small number of multilocular pores; anal ring with ten setae. In life, as far as observed, with slight dorsal secretion and without an ovisac.

Type of the Genus. *Cryptostigma ingae* n. sp.

Notes. The combination of characters given above distinguishes this genus very markedly from any other that has been described. The position of the spiracles, directly beneath the end of the stigmatic clefts is especially peculiar.

Cryptostigma ingae n. sp. (Fig. 4)

Type Host and Locality. From *Inga Laurina*, "guama," Lares, Porto Rico.

Habit. Occurring inside the hollow twigs, attended by an ant, *Myrmelachista ambigua ramulorum* Wheeler. In the specimens examined the dorsum bore but a small amount of secretion and there was no evidence of an ovisac. From each stigmatic cleft, however, there arises a thick pencil of white wax.

Morphological Characters. Length (on slide) 2.4 mm. Derm membranous throughout except for a narrow area encircling the anal plates and the plates at the base of the stigmatic clefts. Antennae (Fig. 4C) very small, indistinctly four-segmented. Legs reduced to unsegmented vestiges, which, however, still retain the claw (Fig. 4F). Plates at the base of the very deep stigmatic depressions (Fig. 4G) heavily chitinized and thickly beset with small pores. Spiracles very large. Marginal setae (Fig. 4E) small, conical, arranged in an irregular single row. Anal plates (Fig. 4B) relatively very large, together forming an elongate oval, each with several small setae above. The condition of the specimens does not permit the determination of the ventral charac-

ters of the plates. Anal ring very small, lying beneath the anal plates and apparently with ten setae. Dorsum with none but small, simple pores with chitinized rim. Venter with a relatively small number of circular, multilocular pores (Fig. 4D) in the genital region.

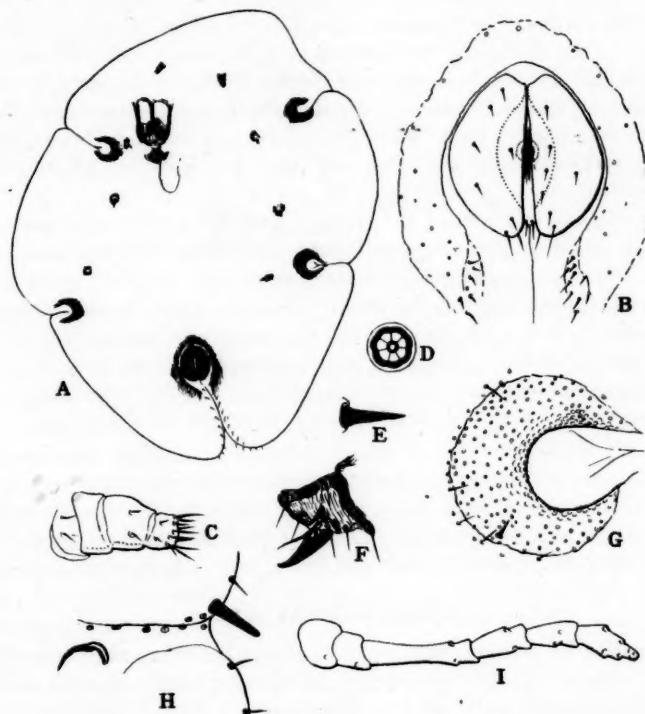


Fig. 4. *Cryptostigma ingae* n. sp.: A.—adult; B.—anal plates and surrounding region of adult; C.—antenna of adult; D.—circular pore of venter of adult; E.—marginal seta; F.—anterior leg of adult; G.—plate at base of stigmatic depression; H.—stigmatic depression and spiracle of first stage; I.—antenna of first stage.

First stage with the antennae (Fig. 4I) quite slender, six-segmented. Marginal setae extremely small, filiform, quite numerous. Spiracles close to the lateral margin, the stigmatic depressions well marked, with a single stout seta on the anterior margin. Anal plates set in a deep cleft, in general form much as in the adult but bearing a very long seta at the apex.

Notes. For the material of this interesting species I am indebted to Mr. G. N. Wolcott, Entomologist of the Insular Experiment Station at Rio Piedras, Porto Rico.

NEW SPECIES OF THE OLD GENUS LEPTURA
AND ALLIED GENERA (COLEOP.)

BY RALPH HOPPING,

Dominion Entomological Branch, Vernon, B. C.

The flora of California is unique, in that most species are found only within the boundaries of the state and some are so localized as to occur only within the boundaries of one county. This is not confined to annuals and flowering shrubs. Many of the conifers and oaks are extremely local in their distribution, and are undoubtedly remnants of a former flora, which owing to sheltering circumstances or the adaptability of the individual has persisted and flourished under new conditions. It is, therefore, small wonder that the insect fauna presents many localized species, where so many different food plants exist with limited distribution.

For the past year Dr. J. M. Swaine and the author have been making an exhaustive study of the old genus *Leptura* as embraced by Henshaw's "Check List of the Coleoptera" and divided into 13 genera by Leng's "Catalogue of the Coleoptera of North America, North of Mexico." Pending the publication of this revision it seems advisable that the following new species be referred to under the generic name *Leptura*. These species seem very local in their distribution, as is no doubt the case with Van Dyke's *Leptura scapularis* and Fall's *L. subcostata* and *L. kernii* of all of which I have seen the types.

I wish to express my thanks to Mr. C. A. Frost of Framingham, Mass., for kindly comparing some of these specimens with the Le Conte types, and for his examination of *L. rhodopus* Lec. which, in Mr. Frost's opinion, is a distinct species with the legs reddish and not black as stated by Leng; although the original description states "feet bright ferruginous" the tarsi are black.

***Leptura isabellae* n. sp.**

A small, robust species, entirely black except the elytra which are maculate; dorsal and ventral surface subopaque and rather closely covered with pale, coarse vestiture, longer on the head and prothorax.

The head coarsely, irregularly punctate, slightly narrower than the prothorax and moderately depressed between the eyes; antennae filiform three-fourths the entire length of the insect in the ♂, one-half that length in the ♀ and somewhat stouter.

The prothorax as wide as long; margins evenly rounded in outline, narrowing strongly at apex, anteriorly and posteriorly margined; anterior and posterior transverse impression feeble; basal angles subacute, pronotum coarsely punctate and strongly convex; intercoxal piece linear.

The elytra ferruginous, sparsely punctured, broader than the pronotum, gradually narrowed from base to apex; with black maculations, each elytron having a black, circular, noticeably concave spot at the posterior portion of the basal third, approaching but not quite meeting the sutural margin, a black spot in the same relative position attaining the outer margin, a larger postmedian black spot, distant from the suture but extending to the outer margin, the suture,

outer margins and apices black, vesture sparse and coarse, pale on the ferruginous portions, black on the maculations; apices subtruncate.

The hind tibial spurs long; legs and antennae in ♂ longer than in ♀; metasternum bidentate in ♂; metepisternum sides parallel, broad (width one-third length); female stouter than male.

Length, ♂, 7 mm.; ♀, 8 mm.

Five males and two females examined, four (2♂♂ and 2♀♀) collected at Isabella, Kern Co., Calif., in 1913, two (♂♂) collected at Waltham Cr., Fresno Co., Calif., in 1907, and one ♂ given me by Mr. F. W. Nunenmacher, collected in Esmeralda Co., Nevada. The elytra of the Waltham Creek and Nevada specimens are testaceous instead of ferruginous, the Nevada specimen having also testaceous femora.

Type, a male in the Canadian National Collection, Ottawa; *Paratypes*, ♂ and ♀, in the collection of the author, all from Isabella, Calif.

This species should be placed probably just before *L. sexpilota*, from which it may easily be distinguished by the position and concavity of the basal, discoidal, black spot, the shorter form, and sparser vestiture.

Leptura isabellae seems to be found only in the semi desert regions of California and Nevada.

Leptura swainei n. sp.

A small stout species, opaque, black, except the legs and antennae, which are bicolored.

The head is coarsely punctate, slightly narrower than the prothorax with vestiture sparse and pale; antennae filiform, brown except the scape which is testaceous.

The prothorax is slightly longer than wide; vestiture long, sparse, pale and moderately fine; pronotum coarsely and irregularly punctate, sides subangulate just anterior to the middle, narrowing to the apex which is marginated, basal margin canaliculate with channel shining; basal angles acute; intercoxal piece linear.

The elytra are black, opaque, with short black vestiture; the sides parallel; convexly rounding the apices, which are obliquely subtruncate.

The legs have the femora testaceous and tibia and tarsi brown; metepisternum wedge-shaped, metasternum not dentate in ♂. Length, ♂ 7.5 mm.; ♀ 8 mm.

Type, a male, in the Canadian National Collection, Ottawa; one *Paratype*, a female, is in the author's collection, both collected at Kaweah, Tulare Co., Calif., at an elevation of 1000 feet in the foothills of the Sierra Nevada Mts, by the author in 1892.

This species should come immediately after *L. sexpilota* but may easily be distinguished by its black elytra with short vestiture, shape of prothorax, elytra with convexly rounded apices, and absence of teeth on the metasternum of the male.

The female is larger and more robust than the male.

Leptura lucifera n. sp.

Of medium size, wholly black, except the elytra which are red; ventral

aspect shining; dorsal aspect feebly shining, with a peculiar dull sheen to the elytra.

The head is black, as wide as the prothorax, coarsely punctate, abruptly constricted behind the eyes, with transverse impression, front steep, strongly impressed between the antennae. Antennae black, two-thirds as long as body, scape enlarged at apex to twice the width of second segment, third and fourth segments linear, 5th widened at apex to twice its basal diameter and flattened, segments 6 to 11 wide and flattened.

The prothorax black, coarsely punctate, slightly and evenly narrowing to apex which is margined, basal angles obtuse, base not margined, bisinuate, with a short basal transverse impression, narrower than base of elytra; sides slightly constricted immediately anterior to basal angles; intercoxal piece narrow.

The elytra red, with well defined widely separated punctures, sides parallel, vestiture very short and sparse, apices transversely truncate, slightly dehiscent.

The metepisternum is broad, sides parallel, outer side margined. The legs are black, hind tibial spurs of medium length. The abdominal segments have sericeous vestiture on posterior margins. Length 13 mm.

Type, a male, in the Canadian National Collection; one *Paratype* in the collection of Mr. Wenzell. The type was collected in Cochise Co., Ariz., August 12, 1908, the paratype from the Jemez Mts., N. M. The prothorax is of the *L. sanguinea* type. The only near approach in color is *L. ignita* Sch., a very distinct species.

While this description was in manuscript Mr. H. W. Wenzel of Philadelphia sent me for examination 2 specimens of this genus from Jemez Mountains of New Mexico, one of which seems unquestionably to be a male of Col. Casey's *Leptura haldemannii*, and the other a smaller female (10 mm.) of the above described *L. lucifera*. As both specimens were caught at the same time and place, one a male and one a female there is a suggestion that *L. lucifera* may be the female of *L. haldemannii*; but aside from the entirely different color which occurs in other species like *L. laetifica* the punctation of the elytra is so utterly different that I have decided to let this species stand until we can prove it is or is not the other sex. Mr. Wenzel's specimen from New Mexico seems identical except for size and I have made it a paratype.

Anthophilax liebecki n. sp.

Robust, entirely black except the rufous elytra with apices black.

The head has moderate shallow punctures, and is strongly constricted immediately behind the eyes; the eyes large, distinctly, strongly emarginate, head not sulcate as in some species, antennae filiform, segments 1 to 4 piceous, 5 to 11 griseous.

The thorax is strongly angulate, constricted and strongly margined anteriorly and posteriorly, punctures coarse, pronotum sulcate.

The elytra are rufous, sparsely, distinctly punctured with sparse golden vestiture; apices black, truncate. Male type.

Stouter, pronotum with lateral, median, obtuse tubercle, female.

The male, length, 12 m.m., width, $4\frac{1}{2}$ m.m.; the female, length, 14 mm.; width, 7 mm.

Habitat, Texas, two specimens ♂ and ♀.

Type, a male in the National Collection at Ottawa, and *Paratype*, a female in the collection of Mr. Chas. Liebeck of Philadelphia, through whose kindness I was able to describe this species.

This is a very robust species, being shorter in proportion than any other of our described species of *Anthophilax*. The brush-like sole of the first tarsal segment is darker than that of the second and third.

***Anthophilax mirificus* Bland.**

Anthophilax venustus Bland, Proc. Ent. Soc. Phila., IV, 1865.

Pachyta costaricensis Bates, Bio. Cent. Am. Vol. 5, 1885.

I was much surprised, in going over the *Biologia Centrali Americana*, to find, under Fig. 1 on Plate XX of Vol. V, an exact reproduction of the male of our *Anthophilax mirificus* Bland under the name *Pachyta costaricensis*, nor can I find anything in the description to separate it from Bland's species. The locality is given as "Costa Rica, Volcan de Irazu, 6000 to 7000 feet (Rogers)". It would seem a far cry from the localities given by Nicolay¹, (Colo., Utah, Mont., Id., Ore., and Calif.) to Costa Rica.

However, the plate is such an exact reproduction and the size given by Bates so exactly the size of the males before me, that I have not the least doubt that they are the same species. This does not seem remarkable when it is recalled that species found in the southern United States are known to extend into Mexico and probably into Central America, as, for instance, *Ptychodes trilineatus* L., extending in its distribution from the southern United States to South America and even to Tahiti. Also many of our species found at comparatively low elevations in Alaska and British Columbia are also found in Colorado, New Mexico and Arizona at comparatively high elevations and may well extend into Mexico and Central America.

In looking up Bland's original descriptions I find that *A. venustus* was the male and not the female, as cited by recent authors and Leng's recent catalogue.

Bland says², "Body black, coarsely punctured; elytra rufous with black markings," and further on in the description, "Elytra rufous . . . a circular black mark on the base, extending half way between the scutel and humeri, a small oblong black dot near the suture about one-sixth from the tip." Under *A. mirificus* he does not state the color of the elytra but his "anterior half grossly and rugosely punctured" sufficiently designates the female.

Leconte³ seems to have recognized that Bland's *A. mirificus* was the female, "and the elytra punctured and rugose before the middle," in comparing it with *A. tenebrosus*.

In Nicolay's "Synopsis", already referred to, not one species of *Anthophilax* is given as occurring in Canada, nor do I find any mention of the

¹Syn. of the Anth. of N. A. Jour. of N. Y. Ent. Soc. Vol. XXV Mech. 1917.

²Proc. of Ent. Soc. of Phila. 1865, p. 383.

³Smith Milie., Coll. XI, No. 264, 1873, p. 208.

⁴A Preliminary List of the Insect of the Province of Quebec, Pt. III, Coleop. 1917, p. 233.

genus occurring in Canada in Leng's "Catalogue." Mr. Chagnon⁴ lists three species as occurring in Quebec, viz *A. attenuatus*, *malachiticus* and *viridis*. I have also before me *A. viridis* from Halifax, N. S., *A. malachiticus* from Eastern Ontario, *A. venustus* from Ontario, and three males and 11 females of *A. mirificus* from the Midday Valley near Merritt, B. C., and one male from Vernon, B. C., in the head of the Okanagan Valley.

Although Bland mentions that both his specimens described as *A. mirificus* and *A. venustus* may be sexes of the same species and were taken from the same tree he does not mention the tree species. In British Columbia they were found by my son George Hopping breeding in the western yellow pine (*Pinus ponderosa*) and emerging from trees killed by *Dendroctonus* several years before. Later Mr. Frank Sheriff of Melrose Highlands, Mass., and the writer, found three pairs in copulation under the bark of trees killed by *Dendroctonus* the previous summer. Several females were also found depositing their eggs in trees one year dead.

Prof. H. F. Wickham in his "List of the Coleop. of Canada" published in the Canadian Entomologist, lists three of the above species, and there are a number of references to captures, but the record of *A. mirificus* does not seem to appear in literature.

Typocerus gloriosus n. sp.

Ventral surface with legs rufous, except the prothorax black; dorsal surface with rufous antennae and pronotum; elytra yellow with black and brown bands and spots.

The head is narrower than the base of pronotum, finely, densely punctured, and sharply constricted rather far behind the eyes, gula black, vestiture golden, especially dense behind the eyes; antennae serrate and very stout and short.

The pronotum is about as long as wide, anterior transverse impression deep, posterior transverse impression not extending to basal angles, punctuation coarse and only moderately close, longitudinal median impression broadly impressed, rufous.

The elytra are opaque with golden vestiture, darker on the black portions, moderately dense; punctures fine but not very closely placed; maculate, testaceous with basal testaceous spot, humeri light brown, basal band dark brown, median transverse oval spot black, subapical wide band black and apices black; the black maculations with nebulous brown margins apices emarginate. The legs and antennae are stout, even for this genus, and the unique specimen has the usual characters of the genus including the poriferous areas on the distal articles of the antennae.

The beautiful specimen was very kindly donated by Mr. Chas. Liebeck of Philadelphia. It has a slight resemblance to *T. balteatus*, but differs greatly since the latter is not nearly so robust, has the antennae more slender and black from the sixth segment distally, and the elytra are coarsely sparsely punctate, shining, with narrow black bands.

Type, a male, in the Canadian National Collection at Ottawa, from Ft. Wingate, New Mexico. Length, 13 mm.

OBITUARY NOTICE

LACHLAN GIBBS.

The death occurred on March 1st, at his residence, Blackheath Park, London, Eng., of an Entomologist, beloved by a host of friends on both sides of the Atlantic. With his death the long line of Gibbs, who have been outstanding figures in Montreal, comes to an end, his forefathers having been connected with the Montreal firm of men's outfitters, Gibbs & Company, since its establishment in 1775, and represented for years in London under the firm name of Gibbs Bros.

Mr. Lachlan Gibbs was born in London in 1852 and was educated there. His first visit to Montreal was in 1874 and he at once sought out the few entomologists and became interested in the Montreal Branch of the Entomological Society of Ontario. The interest never slackened till the day of his passing away. He resided in Montreal but a few years, returning to England, but after several visits of a few months' duration on business and pleasure he took up his residence in Montreal in 1896, becoming manager of the firm, and making the city his headquarters till 1911—after which he made yearly visits to the city from London.

He was a member of the Church of England, and a keen churchman. While his residence was on the other side, he invariably arranged that his annual visits would synchronize with the meetings of the Synod here. He had an immense number of interests—commercial, artistic, musical and philanthropic—but in addition he had three hobbies—gardening, stamp collecting, and entomology. It is hard to say of which of these his heart was fondest. His garden was always a delight to visit—he always wanted to have others enjoy it, and to give roots, cuttings and seeds to everyone. His collection of stamps, particularly of the British Empire, was very valuable, and he presented a number of rare stamps to King Edward VII. for his collection. He made many collections of Lepidoptera, not for himself but to give to others—individuals and societies. The Blue Butterflies (*Lycaenae*) were always his favorites, and no trouble was too great for him to secure rare species and varieties and through his kindness a fine representation of variations of three of the British Blues was presented to the writer, and by him placed in the Lyman Entomological Room of McGill University, as well as a great many other interesting species. To quote from the "Entomologist", Vol. LV., p. 96: "When *Lycaena arion* turned up in Cornwall he wrote from Montreal to a friend in England that he was coming across on a certain steamer and to meet him at Exeter on a specified evening. He said, 'I must see that big blue alive.' They met, found the blue in numbers, and the same evening posted the majority of them alive to friends at a distance who, as he said, had not the opportunity of seeing the species for themselves. That was the man! It was never any question of exchange, he simply wished to give his friends a share of his own delights."

On his last visit to Canada in 1921 his friends all noticed a great change in his health and appearance, and he felt in bidding us good-bye that it would be his last voyage across the Atlantic. He was never a very robust man, but of wonderful energy and nervous activity, but latterly his strength failed him and he was doing too much for his bodily strength. The writer spent two days

at his delightful country home at Como, Que., to help him in his efforts to get our wood white butterfly, *Pieris napi* vars., across to the British Entomologists alive for purposes of cross breeding. We secured quantities of the eggs, which hatched before Mr. Gibbs sailed, but by preparing pots of cress plants ahead, and taking the menageries in his stateroom, he at last succeeded in rearing many imagos on British soil.

We had such long chats among the beautiful trees and fields of his lovely estate, about insects, flowers, and of entomologists of both sides of the Atlantic, living and dead, that our memory of our dear friend seems to tell us that he cannot really have passed out from our midst. To the members of the Montreal Branch he has always been a true friend indeed, and what more can one say. To know him was to love him.

He contributed little to the periodicals—perhaps the two articles in the Canadian Entomologist, Vol. XXV., 88 and 177, were the only ones from his pen—but his letters were full of valuable information and helpfulness. He became a fellow of the Entom. Society of London in 1913, and since 1884 belonged to the South London Ent. and Nat. Hist. Society. When he sailed from Montreal, he went home full of another purpose than that of the white butterflies or of his own failing health. It was to take his grandson on a trip to Scotland, to the scenes of his early pleasures with the Burnet moths. In spite of his enfeebled condition and at the age of 70 he accomplished his purpose. They went to Braemar and found *Zygaena exulans* flying. They crossed into Argyleshire and again found *Z. achilleae*, and returned much elated with their success. His delight was in helping others to enjoy the wonders of nature—and particularly the younger people of both sexes. When on his death bed and almost too weak to speak he said to Mr. R. Adkin, P.E.S., who was called to him before he passed away: "Do encourage the youngsters to take up Entomology; it has been such a help to me."

He was laid to rest in Charlton Cemetery on a beautiful spring day such as he would have loved.—A. F. W.

A CORRECTION.

I find that the name *Argyroploce deceptana* McD. (Can. Ent. 1922, LIV, 42) is preoccupied by *A. deceptana* Kft. I propose therefore to replace it by *Argyroploce apateticana* n.n.

